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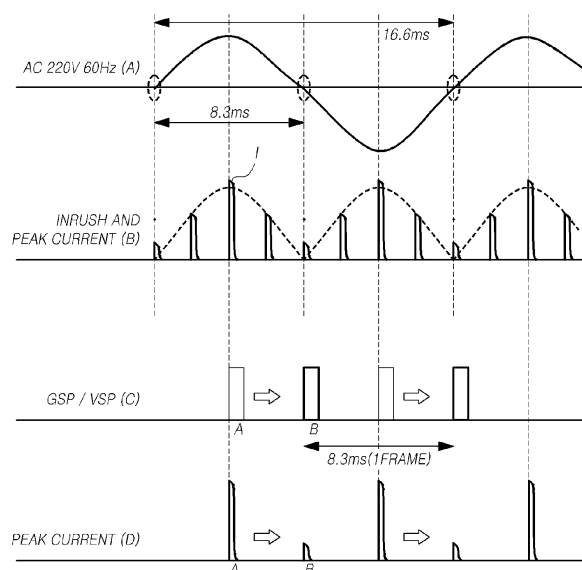
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(54) **DISPLAY DEVICE, ELECTRONIC APPLIANCE INCLUDING THE SAME, AND EXTERNAL POWER SUPPLY DEVICE**

(57) The present invention relates an electronic appliance having a display device that displays an image and to a method for operating a display device and to a power supply device providing a driving voltage to a display device. To provide a display device avoiding high inrush current to provide high quality in displaying images a Electronic appliance including a display device (100), the display device (100) is connected to an power supply device (190) providing a driving power (AC) to the display device (100), the display device (100) comprises a display panel (110) having a plurality of data lines (DL) and gate lines (GL) crossing each other, a plurality of pixels arranged in matrix form defined by the data and gate lines (DL, GL), a data driver (120), a gate driver (130), a timing controller (140) adapted to control the data and gate drivers (120, 130), wherein the timing controller (140) is adapted to control the driving of each gate line (GL) of the gate driver (130) to correspond to a zero-cross point of the driving power (AC) supplied from the power supply device (190) for driving the display panel (110).

FIG. 7



EP 3 016 096 A3



EUROPEAN SEARCH REPORT

Application Number
EP 15 19 2245

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 97/07493 A1 (MIKOHN GAMING CORP [US]) 27 February 1997 (1997-02-27)	1,15	INV. G09G3/32 H02M7/12
Y	* the whole document *	12-14	

X	VLADIMIR CUK, JOSEPH F.G. COBBEN, WIL L. KLING: "Inrush Related Problems Caused by Lamps with Electronic Drivers and Their Mitigation", Electrical Engineering Department, Electrical Energy Systems Eindhoven University of Technology 18 August 2011 (2011-08-18), XP002754677, ISBN: 978-1-61804-023-7 Retrieved from the Internet: URL: http://www.wseas.us/e-library/conferences/2011/Corfu/SYSTEMS/SYSTEMS-52.pdf [retrieved on 2016-02-22]	1-4,8,9,11	
Y	* the whole document *	5-7,10,12-14	TECHNICAL FIELDS SEARCHED (IPC) G09G H02M
Y	E. Ten Winkel: "Dimmer Arduino", Arduino diy 19 October 2012 (2012-10-19), XP002754678, Retrieved from the Internet: URL: https://arduino diy.wordpress.com/2012/10/19/dimmer-arduino/ [retrieved on 2016-02-22] * the whole document *	5-7,10	

Y	US 2014/176516 A1 (KIM JUNG HYEON [KR] ET AL) 26 June 2014 (2014-06-26) * the whole document *	12-14	

The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 June 2016	Examiner Bader, Arnaud
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)



Application Number

EP 15 19 2245

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 15 19 2245

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-11, 15

Reduction of inrush current

2. claims: 12-14

Compensation of transistor characteristics (e.g. threshold variation)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 19 2245

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-06-2016

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